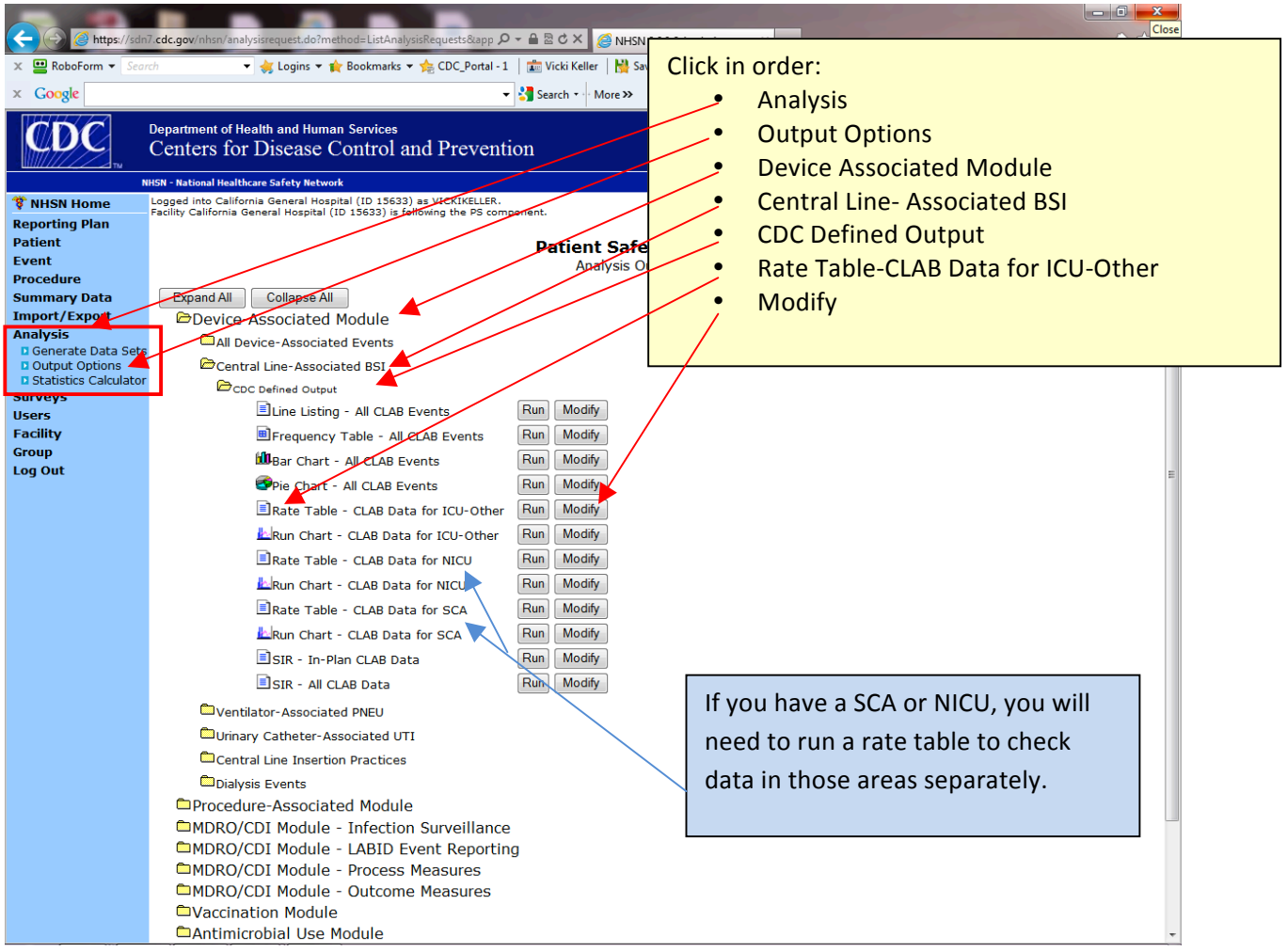
Using NHSN Analysis Features for Prevention: CLABSI

By using the Analysis function in NHSN, you can verify that all your monthly summary data (patient days and central line days) and events (CLABSI) have been entered. We will demonstrate various ways to look at the data, assess significance of changes (increases or decreases) over time, and identify variables to consider when reporting data to your hospital committees.

1. Always begin by generating a data set prior to using the Analysis feature to be sure all data are current.

2. In the NHSN Portal click Analysis →Output Options→Device Associated Module→ Central Line-Associated BSI→ CDC Defined Output→ Rate Table – CLAB Data for ICU-Other→Modify.



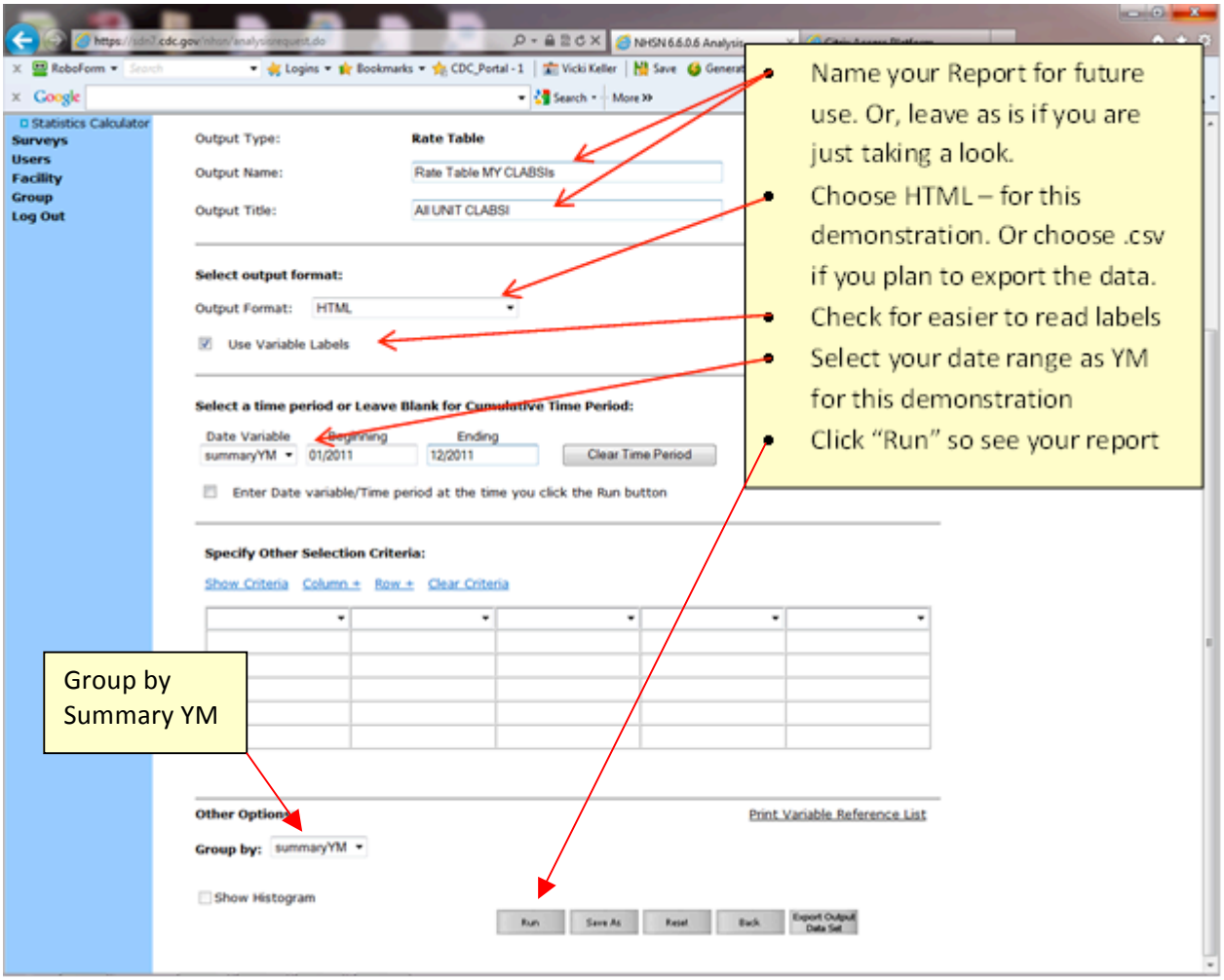
3. Give your Output report a name if you wish.

4. Select output format. HTML format looks nice in a report. CSV file format is the best if you're going to export to an Excel spreadsheet.

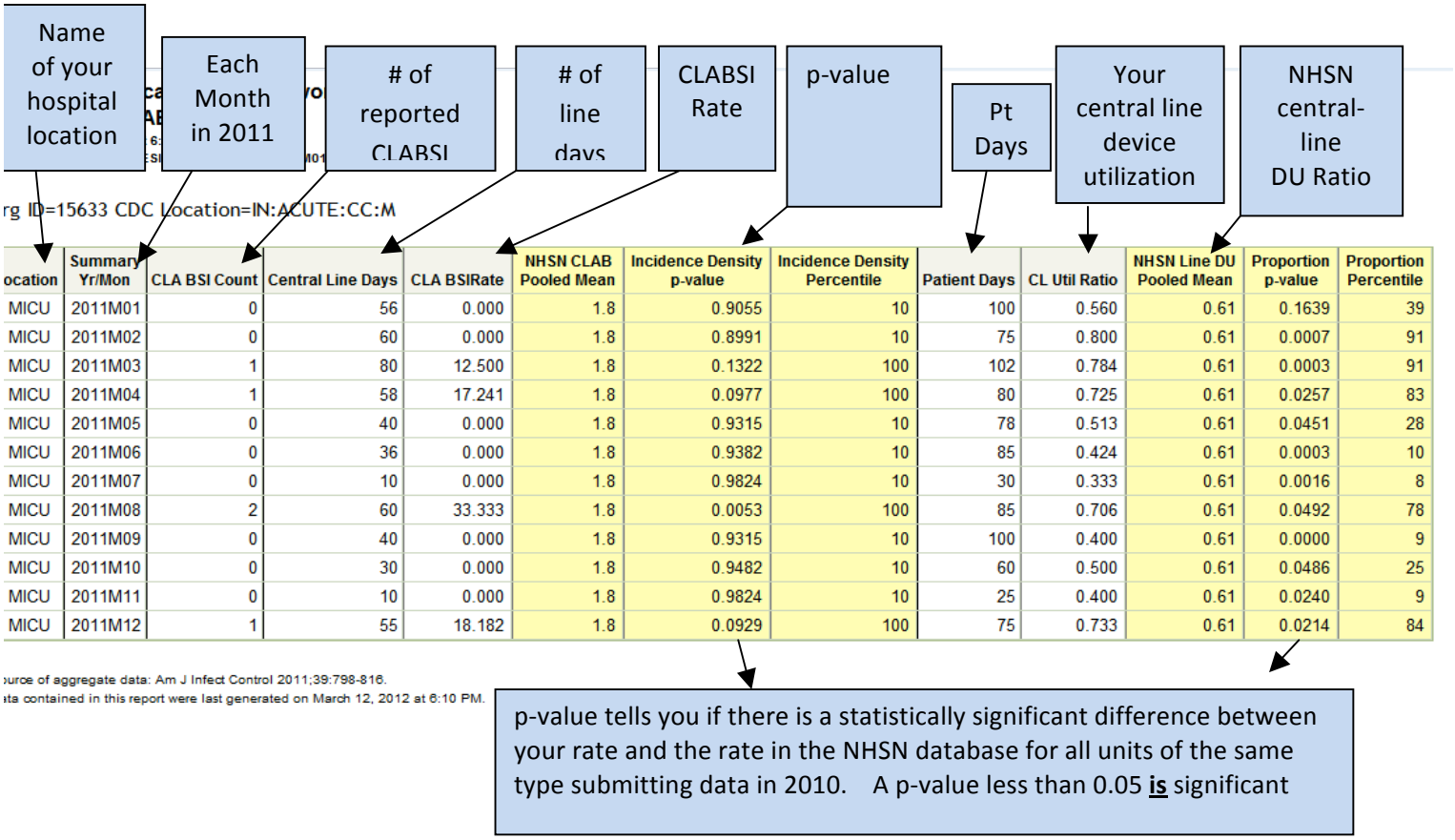
5. Use Variable Labels to make reports easier to understand.

6. Choose a date range for your output report. The Year and month (YM) option is best for checking the completeness of your data. It allows you to view that you have entered data each month. (Be sure the "Group by" also has SummaryYM in the drop down box at the bottom left of the page).

7. Click "Run" to see the data right now. We will discuss the export option later.



Your CLABSI rate table report will look like the following screen shot. We are only showing one location. Your report will show all locations for the time period you have entered.



ocation	Summary Yr/Mon	CLA BSI Count	Central Line Days	CLA BSIRate	NHSN CLAB Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	CL Util Ratio	NHSN Line DU Pooled Mean	Proportion p-value	Proportion Percentile
MICU	2011M01	0	56	0.000	1.8	0.9055	10	100	0.560	0.61	0.1639	39
MICU	2011M02	0	60	0.000	1.8	0.8991	10	75	0.800	0.61	0.0007	91
MICU	2011M03	1	80	12.500	1.8	0.1322	100	102	0.784	0.61	0.0003	91
MICU	2011M04	1	58	17.241	1.8	0.0977	100	80	0.725	0.61	0.0257	83
MICU	2011M05	0	40	0.000	1.8	0.9315	10	78	0.513	0.61	0.0451	28
MICU	2011M06	0	36	0.000	1.8	0.9382	10	85	0.424	0.61	0.0003	10
MICU	2011M07	0	10	0.000	1.8	0.9824	10	30	0.333	0.61	0.0016	8
MICU	2011M08	2	60	33.333	1.8	0.0053	100	85	0.706	0.61	0.0492	78
MICU	2011M09	0	40	0.000	1.8	0.9315	10	100	0.400	0.61	0.0000	9
MICU	2011M10	0	30	0.000	1.8	0.9482	10	60	0.500	0.61	0.0486	25
MICU	2011M11	0	10	0.000	1.8	0.9824	10	25	0.400	0.61	0.0240	9
MICU	2011M12	1	55	18.182	1.8	0.0929	100	75	0.733	0.61	0.0214	84

ource of aggregate data: Am J Infect Control 2011;39:798-816.
ata contained in this report were last generated on March 12, 2012 at 6:10 PM.

p-value tells you if there is a statistically significant difference between your rate and the rate in the NHSN database for all units of the same type submitting data in 2010. A p-value less than 0.05 **is** significant

Assess for completeness:

- Is every month included in your date range for every unit?
- Are all CLABSI for the date range entered?
- Are all central line days entered?
- Are all patient days entered?

If incomplete: Go back to your Summary Data Screen and enter the appropriate data – then generate a new data set to run another report

Run this report monthly to be sure all your data have been entered for every location, every month.

Evaluate your CLABSI rates:

How do your CLABSI rates compare with the NHSN database? Look at your CLABSI rate, the NHSN pooled mean, and the corresponding p-value. Are the differences significant?

IMPORTANT: For the rate comparisons to be large enough or meaningful, in most hospitals it will be better to re-run your CLABSI rate tables using a quarterly or semi-annual Date Variable (SummaryYQ or Summary YH) instead of monthly. That will be demonstrated later.

Evaluate your use of central lines:

Look at your central line Device Utilization Ratios (DUR), which is the number of device days divided by the number of patient days. How do they compare to the central line DUR from the NHSN database? Can you see any correlation between your central line DUR and your CLABSI rate?

In our example below, you can see the months with CLABSI also had a higher central line DUR than what would be expected based on the NHSN data (In our example, comparison is to all medical ICUs submitting data to NHSN in 2010).

Org ID=15633 CDC Location=IN:ACUTE:CC:M

Location	Summary Yr/Mon	CLA BSI Count	Central Line Days	CLA BSIRate	NHSN CLAB Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	CL Util Ratio	NHSN Line DU Pooled Mean	Proportion p-value	Proportion Percentile
1 MICU	2011M01	0	56	0.000	1.8	0.9055	10	100	0.560	0.61	0.1639	39
1 MICU	2011M02	0	60	0.000	1.8	0.8991	10	75	0.800	0.61	0.0007	91
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1 MICU	2011M09	0	40	0.000	1.8	0.9315	10	100	0.400	0.61	0.0000	9
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1 MICU	2011M11	0	10	0.000	1.8	0.9824	10	25	0.400	0.61	0.0240	9
1 MICU	2011M12	1	55	18.182	1.8	0.0929	100	75	0.733	0.61	0.0214	84

8. Return to step 6 and modify the date range to run a report by half year.

Look what happens to your p-value when you run your report by half year. By doing this you have a larger sample, or greater number of central line days and patient days to analyze. See below.

Location	Summary Yr/Half	Months	CLA BSI Count	Central Line Days	CLA BSIRate	NHSN CLAB Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	CL Util Ratio	NHSN Line DU Pooled Mean	Proportion p-value	Proportion Percentile
1 MICU	2011H1	6	2	330	6.061	1.8	0.1170	100	520	0.635	0.61	0.1631	58
1 MICU	2011H2	6	3	205	14.634	1.8	0.0061	100	375	0.547	0.61	0.0051	36

Source of aggregate data: Am J Infect Control 2011;39:798-816.
Data contained in this report were last generated on March 12, 2012 at 6:10 PM.

With half year (YH) you can see the first half-year rate is not significantly different than the NHSN pooled mean of 1.8.

The second half of the year ***is*** significantly different (higher) than the NHSN pooled mean of 1.8.

9. Run a report for the entire year.

In our example below, the number of CLABSI for the year (5), and the number of line days (535) results in a rate of 9.34, which is significantly higher than the NHSN pooled mean for Medical ICUs .

We know the difference between our CLABSI rate is statistically significant than the NHSN rate: p-value of 0.029 (which is less than 0.05).

For 2011, our central line DUR is lower than the NHSN DUR, however we already know from the previous report that in the months with CLABSI, this ratio was higher.

Location	Summary Yr	Months	CLA BSI Count	Central Line Days	CLA BSIRate	NHSN CLAB Pooled Mean	Incidence Density p-value	Incidence Density Percentile	Patient Days	CL Util Ratio	NHSN Line DU Pooled Mean	Proportion p-value	Proportic Percenti
1 MICU	2011	12	5	535	9.346	1.8	0.0029	100	895	0.598	0.61	0.1893	4

Our p-value is significant (<0.05) We can say our CLABSI rate for 2011 is significantly higher than the NHSN database

10. In our example, we compared our hospital's Medical ICU to the NHSN database. But how are we doing this year as compared to last year? We should also be comparing our own rates over time. Have we shown a significant change in our CLABSI since last year?

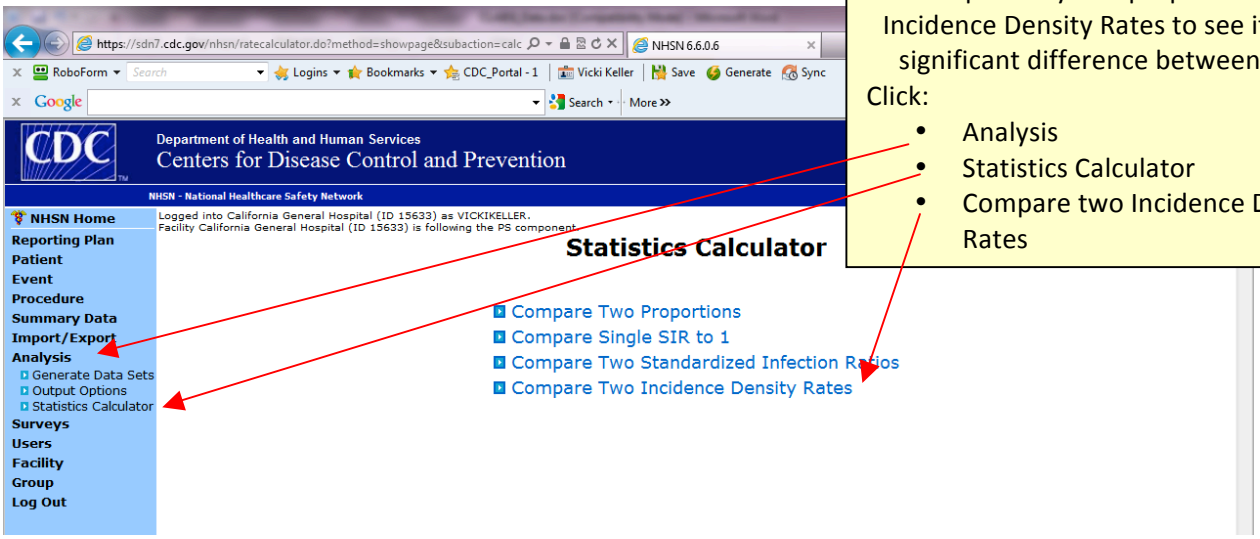
NHSN provides a calculator to make such comparisons.

11 Return to the blue navigation bar on the left of the NHSN page. Click Analysis→Statistics Calculator. Then click "Compare Two Incidence Density Rates"

The Statistics Calculator allows you to compare any two proportions, SIR or Incidence Density Rates to see if there is a significant difference between the two.

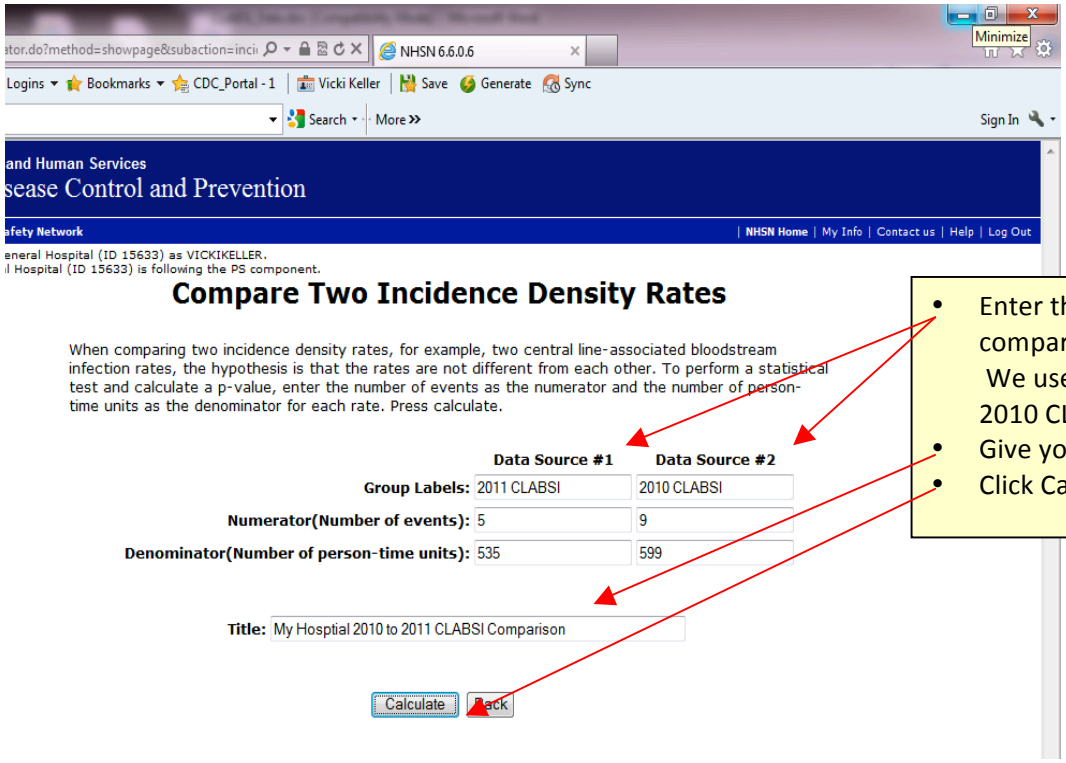
Click:

- Analysis
- Statistics Calculator
- Compare two Incidence Density Rates



12. You will see the screen below. Enter the two rates you wish to compare. In our example we will compare 2011 data, 5 CLABSI and 535 Line days, to our 2010 data (not shown), 9 CLABSI and 599 line days.

On the surface, it looks like we may have improved since last year because 5 CLABSI are certainly less than 9 CLABSI. Let's see if this change is significantly different.



- Enter the two rates you want to compare.
  We used 2011 CLABSI compared to 2010 CLABSI.
- Give your comparison a title.
- Click Calculate

The following table will pop up

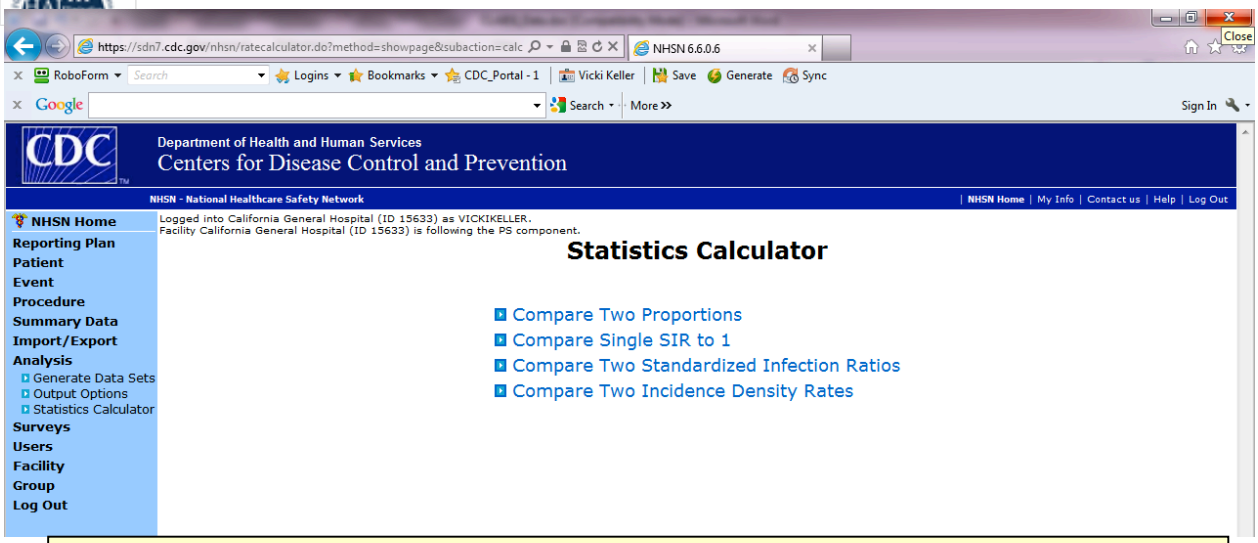
National Healthcare Safety Network
My Hosptial 2010 to 2011 CLABSI Comparison
As of: March 13, 2012 at 1:52 AM

	2011 CLABSI	2010 CLABSI
Numerator	5	9
Denominator	535	599
Incidence Density Rate	9.346	15.025
IDR p-value	0.1877	

Although there was a decrease in the numerator (# of CLABSI) in 2011, the difference from 2010 is not statistically significant.

To look for ways to improve your CLABSI rate, review with your committees / hospital colleagues

- Central line use (remember, the months in which there were CLABSI, the central line DUR was higher than the NHSN database)
- **CLIP data** (records associated with each CLABSI and overall)
- **Line maintenance practices**



The NHSN Statistics Calculator may be used to compare any two proportions, SIR or rates.
This is ideal for comparing your own data over time!

Remember, you cannot change your NHSN data by using the Analysis functions. You won't hurt anything! The best way to become proficient at running reports, analyzing your data, and disseminating the results is to get in there and practice.

For more information about this guidance document, please contact InfectionControl@cdph.ca.gov